

**What is Claimed is:**

5        1. A device for detection of targets comprising an array of at least 4 spaced apart detection zones, each detection zone containing at least 6 spaced apart detection spots in a pre-determined pattern, the detection spots being suitable for providing a detectible indication of the presence of a specific target, there being at least 3 different detection spots in each detection zone,

wherein no two detection zones have the same pre-determined pattern.

10      2. The device of claim 1 wherein at least some of the detection zones are wells.

15      3. A device for detection of targets comprising an array of spaced apart detection zones, at least 4 of the detection zones being randomized, each randomized detection zone containing at least 6 spaced apart detection spots in a pre-determined pattern, there being at least 3 different detection spots in each randomized detection zone,

wherein the pre-determined patterns in the randomized detection zones are randomized.

20      4. The device of claim 3 wherein the detection zones have edges, and the pre-determined patterns are randomized so that edge effects have substantially no effect on the accuracy of the device.

25      5. The device of claim 3 wherein at least some of the detection zones have at least one spot that is not randomized.

30      6. A device for detection of targets comprising an array of at least 4 spaced apart detection zones, each detection zone containing at least 6 spaced apart detection spots in a pre-determined pattern, the detection spots being suitable for providing a detectible indication of the presence of a specific target, there being at least 3 different detection spots in each detection zone,

wherein the pre-determined patterns are determined with a random number generator.

7. A device for detection of targets comprising:

5       a) an array of at least 4 spaced apart detection zones, each detection zone containing at least 6 spaced apart detection spots in a pre-determined pattern, the detection spots being suitable for providing a detectable indication of the presence of a specific target, there being at least 3 different detection spots in each detection zone; and

      b) a readable code that allows a detector to determine the pre-determined patterns.

8. The device of claim 7 wherein the code is machine readable.

10      9. The device of claim 8 wherein the code and the detectable indicator can be read with the same detection device.

15      10. The device of claim 7 wherein the code is encrypted.

11. The device of claim 7 wherein no two detection zones have the same pre-determined pattern.

12. The device of claim 7 wherein the pre-determined patterns are randomized.

20      13. The device of claim 12 wherein the detection zones have edges, and the pre-determined patterns are randomized so that edge effects have substantially no effect on the accuracy of the device.

14. The device of claim 7 wherein the pre-determined patterns are determined with 25 a random number generator.

15. A method for detecting targets in a sample comprising the step of applying the sample to the device of any one of claims 1, 3, 6 and 7.

30      16. A method for detecting targets in a sample comprising the steps of:

      a) selecting the device of claim 7;

      b) applying the sample to the selected device so that the targets cause at least some of the detections spots to provide the detectable indication;

c) reading the readable code to determine the pre-determined patterns; and  
d) detecting the detectable indication and identifying targets present in the sample based on the determined pre-determined patterns.

5        17. The method of claim 16 wherein the code is machine readable, and the steps of reading the readable code, and the steps of reading the readable code and detecting are performed with the same reading device.

10      18. A method of forming a detection array comprising at least 4 spaced apart detection zones, each detection zone containing at least 6 spaced apart detection spots, the detection spots being capable of providing a detectable indication of the presence of a specific target, there being at least 3 different detection spots in each detection zone, the method comprising the steps of:  
a) determining a randomized pattern for the detection spots; and  
15      b) applying the detection spots to a substrate in the determined randomized pattern;

19. The method of claim 18 comprising the additional step of providing a machine readable code that allows a detector to determine the randomized pattern.

20      20. The method of claim 19 in which the machine readable code is placed on the substrate.

21. The method of claim 19 in which the machine readable code is encrypted.

25      22. The method of claim 19 in which the step of determining a randomized pattern comprises determining the pattern with a random number generator algorithm.

23. The invention of claim 1 wherein the array comprises at least 50 detection zones.

30      24. The invention of claim 1 wherein the array comprises at least 30 spots per zone.

25. The invention of claim 1 wherein there are at least 10 different detection spots in each detection zone.

5       26. The invention of claim 1 wherein the array comprises about 96 detection zones, the detection zones are wells, there are about 42 spots per detection zone, and there are about 14 different detection spots in each detection zone.

27. The invention of claim 3 wherein the array comprises at least one detection zone that is not a randomized detection zone .

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28. In a microarray comprising a plurality of detection zones having detection spots in a selected pattern, the improvement comprising the selected patterns being randomized.